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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/083,313 | 02/25/2002 | Sundara Murugan | P4524 | 5495 |

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EXAMINER

TSEGAYE, SABA

ART UNIT PAPER NUMBER

2662

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/083,313 | Applicant(s) MURUGAN, SUNDARA | |
| | Examiner Saba Tsegaye | Art Unit 2662 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed 07/27/05. Claims 1-35 are pending. Currently no claims are in condition for allowance.

Claim Rejections - 35 USC § 112

2. Claims 1-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification fails to describe “that all **application-dependent data** resides locally in **kernel software** of individual APS modules” (claims 1, 12 and 24).

Claim Rejections - 35 USC § 103

3. Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simons et al. (6,332,198) in view of Zadikian et al. (6,724,757).

Regarding claims 1 and 12, Simons discloses, in Figs 1, 5, 29, 33A, an automated-protection-switching software suite for distribution over multiple processors of a distributed processor router comprising:

an APS server module (14, 20, 28) running on a first one of the multiple processors (12) for managing communication and distributing configuration and state information (column 7, lines 25-41); and

Art Unit: 2662

APS client modules (18a-18n, 22a-22n) running on second ones of the multiple processors (16a-16n), the APS client modules for monitoring interface state information, reporting to the APS server application, and for negotiating with other APS client modules (column 7, lines 25-41);

characterized in that all application-dependent data resides locally in kernel software of individual APS modules (**data reflecting the network connections** established by each primary process may be **stored** within each of the backup processes or independently on backup line card 16n (column 42, lines 63-67) this allows to quickly begin transmitting network data over previously established connections to avoid the loss of these connections and minimize service disruption (column 43, lines 1-8)) and further characterized in the that APS interface relocation from a primary interface (16a-16b) to a backup interface (16n) is performed through direct communication between the APS client modules running on the processors supporting the involved interfaces (fig 33a; column 42, lines 39-52).

Further, Simons discloses that a level of hot state (software backup) backup is inversely proportional to the resynchronization time, that is, as the level of hot state backup increases, resynchronization time decreases (column 42, lines 4-11; column 1, lines 33-57). Furthermore, backup line card 16n execute backup processes to provide software backup. It is preferred that line card 16n be at least partially operational and ready to use the backup processes to quickly begin performing as if it was a failed primary line card (column 42, lines 39-52).

However, Simons does not expressly disclose that an APS protocol performs a switchover within a 50-millisecond time window.

Zadikian teaches a router that supports the restoration of a majority of network failures within **less than 50 ms** (column 10, lines 58-55).

It would have been obvious to one ordinary skill in the art at the time the invention was made to add a method that switchover within 50 ms time window, such as that suggested by Zadikian, in the method for supporting multiple redundancy of Simons in order to minimize synchronization time and to provide a fast restoration time.

Regarding claims 2, 3, 13, 27 and 28, Simons discloses the APS software suite wherein the distributed processor router is connected to and operating on a data-packet-network (column 12, lines 50-67).

Regarding claim 4, Simons discloses the APS software suite wherein the APS software suite is implemented to protect the integrity of a plurality of primary interfaces of the router by enabling backup of individual ones of the interfaces at any given time during router operation (column 39, line 43-column 40, line 12; column 45, lines 56-61).

Regarding claims 5, 14 and 29, Simons discloses the APS software suite wherein the plurality of primary interfaces comprises an APS grouping of interfaces connected to a SONET network (column 45, line 56-column 46, line 29).

Regarding claims 6 and 20, Simons discloses the APS software suite wherein the configuration and state information generic to a primary interface for relocation is mirrored to

Art Unit: 2662

the client supporting the backup interface for the purpose of initializing and activating the backup interface to function as the primary interface (column 27, lines 51-67).

Regarding claims 7 and 21, Simons discloses the APS software suite wherein the distributed processors communicate with each other through a network of fabric cards implemented within the router (column 48, lines 1-11; column 50, lines 62-67).

Regarding claims 8 and 22, Simons discloses the APS software suite wherein all communication exchanges between the distributed APS components follow a message sequence scheme wherein each request and response has a sequence number (column 11, lines 31-47).

Regarding claim 9, Simons discloses the APS software suite wherein interface relocation is initiated by an APS client module after detecting an event requiring relocation at the primary interface to be relocated (column 40, line 60-column 41, line38).

Regarding claims 10 and 23, Simons discloses the APS software suite wherein the APS grouping of interfaces is physically supported on one processor (processor 12; column 7, lines 25-41).

Regarding claim 11, Simons discloses the APS software suite wherein the APS grouping of interfaces is distributed to and physically supported by multiple processors (processors 12, 13; column 27, lines 51-67).

Regarding claim 15, Simons discloses the distributed processor router wherein the APS software suit includes a server application, a server-client application, and a client module (column 7, lines 26-41).

Regarding claim 16, Simons discloses the distributed processor router wherein the server application runs on a control card, and the server-client application as well as the client module run on a line card (column 7, lines 26-57).

Regarding claim 17, Simons discloses the distributed processor router wherein indication of an event is an APS signal received through the target interface on the backup processor (column 35, line 58-column 36, line 27).

Regarding claim 18, Simons discloses the distributed processor router wherein the received APS signal indicates one of the failure or severe degradation of the target interface (column 35, lines 36-47; column 36, lines 28-49).

Regarding claim 19, Simons discloses the distributed processor router wherein the received APS signal indicates an administrative request for interface relocation (column 39, lines 10-60).

Regarding claim 24, Simons discloses a method for relocating a primary router interface to a designated backup router interface using an APS suite distributed over multiple processors of a distributed processor data router comprising steps of:

- a) mirroring current configuration and state information of the primary router interface to the processor supporting the designated backup router interface (column 27, lines 51-67);
- b) receiving indication of a requirement to initiate an APS switchover (column 35, line 58-column 36, line 49);
- c) determining if the backup router interface is available (column 35, line 58-column 36, line 49); and
- d) activating the designated backup interface using the mirrored configuration and state information (column 27, lines 51-67).

Further, Simons discloses that a level of hot state (software backup) backup is inversely proportional to the resynchronization time, that is, as the level of hot state backup increases, resynchronization time decreases (column 42, lines 4-11; column 1, lines 33-57). Furthermore, backup line card 16n execute backup processes to provide software backup. It is preferred that line card 16n be at least partially operational and ready to use the backup processes to quickly begin performing as if it was a failed primary line card (column 42, lines 39-52).

However, Simons does not expressly disclose that an APS protocol performs a switchover within a 50-millisecond time window.

Zadikian teaches a router that supports the restoration of a majority of network failures within **less than 50 ms** (column 10, lines 58-55).

It would have been obvious to one ordinary skill in the art at the time the invention was made to add a method that switchover within 50 ms time window, such as that suggested by Zadikian, in the method for supporting multiple redundancy of Simons in order to minimize synchronization time and to provide a fast restoration time.

Regarding claim 25, Simons discloses the method comprising an additional step e) for reporting any changed route results to a task manager responsible for distributing updated route tables to processors (column 28, lines 1-67).

Regarding claim 26, Simons discloses the method comprising an additional step for updating a forwarding database according to a switchover made (column 28, lines 1-67).

Regarding claim 30, Simons discloses the method wherein in step b) the indication is received at the primary interface (column 35, line 58-column 36, line 27).

Regarding claim 31, Simons discloses the method wherein in step b) the indication is received at the backup interface (column 35, lines 36-47; column 36, lines 28-49).

Regarding claim 32, Simons discloses the method wherein in step b) the indication is of the form of an administrative request (column 39, lines 10-60).

Regarding claim 33, Simons discloses the method wherein in step c) determination of availability of the backup interface partly depends on a priority state of the interface requiring backup (column 15, line 66-column 16, line 17).

Regarding claim 34, Simons discloses the method wherein in step c) the backup interface is physically located on a processor separate from that of the primary router interface (fig. 1, 16a-16n; fig. 35, 546e).

Regarding claim 35, Simons discloses the method wherein in step a) the configuration and state information is selected from a table of such sets of information stored on the processor hosting the backup router interface (column 27, line 51-column 28, 65).

Response to Arguments

Applicant's arguments filed 07/27/05 have been fully considered but they are not persuasive. Regarding the 112 rejection, applicant argues that applicant's specification supports the amended claim language; "all application dependent data resides locally in kernel software of individual APS modules"; for example, instances of APS software 209 are provided one on ADM 104 and one on ADM 105. Examiner respectfully disagrees. The applicant's specification does not disclose "all application dependent data resides locally in kernel software of individual APS modules". Specifically, the instant application does not disclose "Kernel". Therefore, the (112) rejection is maintained.

Applicant argues (Remarks, pages 8-9) that information and communication needed to facilitate APS is not stored locally in Simons, the 50-millisecond time frame could not be consistently accomplished. Simon suffers form network data flow interruption because true APS is not accomplished. Examiner respectfully disagrees. Simons discloses a method and apparatus for allowing multiple redundancy schemes in a single network device. Simons clearly discloses

Art Unit: 2662

modular software architecture, **software intelligence is stored locally**. Further, Simons describes that network devices often implement industry standard redundancy schemes, such as those **defined by APS** standard. An APS standard redundancy scheme may be implemented in the network device 540 Fogs 35A-358 (column 49, lines 19-26). Furthermore, Simons discloses multiple line cards 16a-16n. Each line card includes a control processor subsystem 18a-18n, which runs an instance of the kernel 22a-22n including slave and client programs as well as **line card specific software** applications. Furthermore, Simons discloses that a level of **hot state (software backup)** backup is inversely proportional to the resynchronization time, that is, **as the level of hot state backup** increases, resynchronization time decreases (column 42, lines 4-11; column 1, lines 33-57). Backup line card 16n execute backup processes to provide software backup. It is preferred that line card 16n be at least partially operational and ready to use the backup processes **to quickly begin** performing as if it was a failed primary line card (column 42, lines 39-52). Zadikian teaches a network element capable of performing routing functions that supports simple provisioning and fast restoration (50 ms). Zadikian facilitates switch over from a main processor automatically (column 13, lines 20-24). Therefore, at the time of the invention the combination with Zadikian is obvious and 50-millisecond switchover is possible in Simons.

Applicant argues (Remarks, page 9) that Zadikian facilitates switchover from a main processor, and neither of the software intelligence or application dependant data is stored locally, that is in individual APS modules, as is taught in applicant's invention. It is respectfully submitted that the rejection is based on the combined teaching of the Simons and Zadikian references. Simons discloses application dependant data is stored locally. Also, Zadikian teaches that software on a shelf processor module is responsible for managing and controlling line cards.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

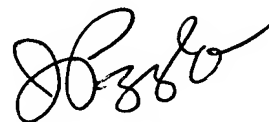
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2662

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ST

October 6, 2005

A handwritten signature in black ink, appearing to read 'J. Pezzlo', with a stylized flourish at the end.

JOHN PEZZLO
PRIMARY EXAMINER